



# El Niño/La Niña Update

## Current Situation and Outlook

*The recent multi-year (so-called “triple dip”) La Niña event is over and the tropical Pacific is currently in an ENSO-neutral state. WMO Global Producing Centres of Long-Range Forecasts predict that there is a 40% chance for ENSO-neutral conditions to continue during May-July 2023, and there is a 60% chance for a transition from ENSO-neutral to El Niño during May-July. El Niño conditions are likely to persist thereafter, with current forecasts and expert assessment indicating the chances gradually increasing to about 60-70% in June-August, 70-80% in July-through October 2023, while the chances of ENSO-neutral are around 30-40% and 20-30%, respectively. The current forecasts rule out La Niña development over the next six months. This month’s update therefore indicates a significantly heightened probability of a transition to El Niño conditions this year, while noting that the Northern Hemisphere ‘spring predictability barrier’, a period characterized by somewhat lower predictive skill, continues to lead to enhanced uncertainty associated with predictions made at this time. National Meteorological and Hydrological Services (NMHSs) will closely monitor changes in the state of ENSO over the coming months and provide updated outlooks, as needed.*

From February 2023 onwards, there has been a significant increase in sea surface temperatures in the Equatorial Pacific, with notably stronger warming along the coast of South America. During the week centered on 12 April 2023, the sea surface temperatures in the far eastern Pacific region known as the Niño 1+2 region have been 2.7 degrees Celsius above normal. The sustained warming of sea surface temperatures in the eastern Equatorial Pacific is attributed to the warmer subsurface temperatures and a downwelling Kelvin wave. Consequently, Coastal El Niño (Coastal El Niño occurs along the western coast of South America, particularly in the regions of Peru and Ecuador) conditions are considered to have been established.

As of mid-April 2023, the sea surface temperatures and other atmospheric and oceanic indicators in the central-eastern tropical Pacific are consistent with ENSO-neutral conditions. In the atmosphere, convective activity over the equatorial Pacific near the International Date Line is near normal. The Southern Oscillation Index (SOI: defined by the standardized Tahiti minus Darwin sea-level pressure difference), is also within the ENSO-neutral range. Easterly trade winds over the western equatorial Pacific are stronger than normal, while normal or weaker in the eastern Pacific. At upper levels of the atmosphere (200-hPa), strengthened westerly winds are observed across the central and east-central equatorial Pacific. In the ocean, positive sub-surface temperature anomalies have spread across the Pacific Ocean, though remaining at relatively deeper levels (100 to 250 meters) in the western and central Pacific, and between the surface and 100 meters in the eastern Pacific (120°W to 80°W). Overall, the observed oceanic and most atmospheric conditions indicate ENSO-neutral conditions in the Pacific.

The WMO Global Producing Centres of Long-Range Forecasts routinely issue global-scale climate forecasts for the coming months, initializing their dynamical seasonal prediction systems using observations. Their latest forecasts and expert assessment indicate that there is a high probability for the sea surface temperature anomalies in the central and eastern equatorial Pacific to warm further, with 60% chance of reaching El Niño levels in May-June 2023 and persisting throughout the coming months: 60-70% chance in June-August, and 70-80% chances during July-September and August-October 2023. The probability for the ENSO-neutral category is 40% in May-July, decreasing to 30-40% in June-August, and 20-30% during July-September and August-October 2023. The chance of La Niña re-development is near zero.

Weaker trade winds, warmer subsurface temperatures, and significant warming in the eastern equatorial Pacific, are conducive to the onset of El Niño. It is worth noting, however, that the Northern Hemisphere 'spring predictability barrier', a period characterized by somewhat lower predictive skill, has not yet ended. Nevertheless, these recent developments in oceanic and atmospheric conditions in the tropical Pacific, along with consistent multi-model predictions and expert assessments, are indicating a strong likelihood of El Niño onset in early boreal summer and its continuation into the boreal autumn of 2023.

It is important to note that El Niño and La Niña are not the only factors that drive global and regional climate patterns, and further that the magnitudes of ENSO indicators do not directly correspond to the magnitudes of their effects. At the regional level, seasonal outlooks need to assess the relative effects of both the ENSO state and other locally relevant climate drivers. Regionally and locally applicable information is made available via regional and national seasonal climate outlooks, such as those produced by WMO Regional Climate Centres

(RCCs), Regional Climate Outlook Forums (RCOFs) and National Meteorological and Hydrological Services (NMHSs).

### **In summary:**

- The recent multi-year La Niña event is over. This was the third "triple dip" La Niña since 1950.
- The tropical Pacific is now in an ENSO-neutral state.
- Model predictions and expert assessment indicate a moderate probability (60% chance) for the onset of El Niño during May-July 2023. This probability is expected to increase to 60-70% during June-August and it is highly likely (with a chance of 70-80%) that El Niño will persist into the boreal autumn of 2023.
- The probabilities for continuing ENSO-neutral conditions are 40% in May-July, 30-40% in June-August, and remain 20-30% during July-September and August-October.
- The chance of La Niña re-development in the coming six months at least is near zero.

The state of ENSO will continue to be carefully monitored by WMO Members and partners. More detailed interpretations of the implications for regional climate variability will be carried out routinely by the climate forecasting community over the coming months and will be made available through the National Meteorological and Hydrological Services.

For web links of the National Meteorological Hydrological Services, please visit:

<https://public.wmo.int/en/about-us/members>

For information and web links to WMO Regional Climate Centres (RCCs) please visit:

<https://public.wmo.int/en/our-mandate/climate/regional-climate-centres>

For information and web links to Regional Climate Outlook Forums (RCOFs) please visit:

<https://public.wmo.int/en/our-mandate/climate/regional-climate-outlook-products>

For the latest Global Seasonal Climate Update (GSCU) based on WMO Global Producing Centres of Long-Range Forecasts, please visit:

<https://www.wmolc.org/gscuBoard/list>

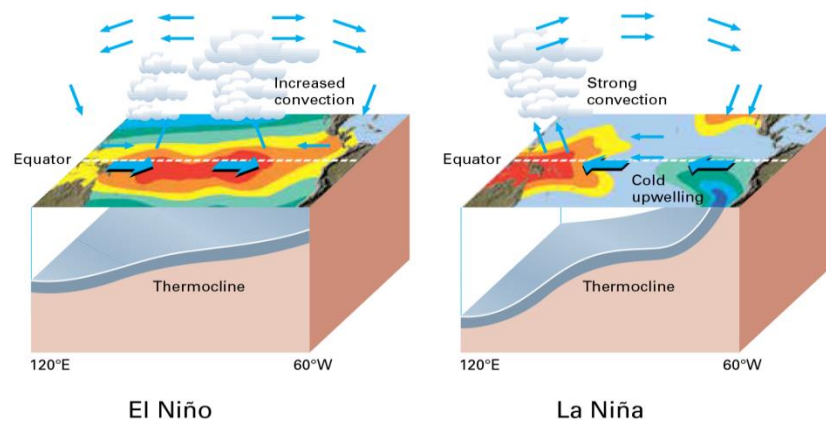
An archive of all WMO El Niño/La Niña Updates issued so far, including this one, is available at:

<https://community.wmo.int/activity-areas/climate/wmo-el-ninola-nina-updates>

## Acknowledgements

The WMO El Niño/La Niña Update is prepared through a collaborative effort between the WMO and the International Research Institute for Climate and Society (IRI), USA, and is based on contributions from experts worldwide, inter alia, of the following institutions: Australian Bureau of Meteorology (BoM), Centro Internacional para la Investigación del Fenómeno El Niño (CIIFEN), China Meteorological Administration (CMA), Climate Prediction Centre (CPC) and Pacific ENSO Applications Climate (PEAC) Services of the National Oceanic and Atmospheric Administration (NOAA) of the United States of America (USA), European Centre for Medium Range Weather Forecasts (ECMWF), Météo-France, India Meteorological Department (IMD), Indian Institute of Tropical Meteorology (IITM), International Monsoons Project Office (IMPO), Japan Meteorological Agency (JMA), Korea Meteorological Administration (KMA), Met Office of the United Kingdom, Meteorological Service Singapore (MSS), WMO Global Producing Centres of Long Range Forecasts (GPCs-LRF) including the Lead Centre for Long Range Forecast Multi-Model Ensemble (LC-LRFMME).

## El Niño/La Niña Background



Typical circulation patterns during El Niño/La Niña (Source: WMO, 2003, “Climate into the 21<sup>st</sup> Century”).

### Climate Patterns in the Pacific

Research conducted over recent decades has shed considerable light on the important role played by interactions between the atmosphere and ocean in the tropical belt of the Pacific Ocean in altering global weather and climate patterns. During El Niño events, sea surface temperatures in the central and eastern tropical Pacific Ocean become substantially warmer than normal. In contrast, during La Niña events, the sea surface temperatures in these regions become colder than normal. These temperature changes are strongly linked to major climate fluctuations around the globe and, once initiated, such events can last for 12 months or more. The strong El Niño event of 1997–1998 was followed by a prolonged La Niña phase that extended from mid-1998 to early 2001. El Niño/La Niña events change the likelihood of particular climate patterns around the globe, but the outcomes of each event are never exactly the same. Furthermore, while there is generally a relationship between the global impacts of an El Niño/La Niña event and its intensity, there is always potential for an event to generate serious impacts in some regions irrespective of its intensity.

### Forecasting and Monitoring the El Niño/La Niña Phenomenon

The forecasting of Pacific Ocean developments is undertaken in a number of ways. Complex dynamical models project the evolution of the tropical Pacific Ocean from its currently observed state. Statistical forecast models can also capture some of the precursors of such developments. Expert analysis of the current situation adds further value, especially in interpreting the implications of the evolving situation below the ocean surface. All forecast methods try to incorporate the effects of ocean-atmosphere interactions within the climate system. The meteorological and oceanographic data that allow El Niño and La Niña episodes to be monitored and forecast are drawn from national and international observing systems. The exchange and processing of the data are carried out under programmes coordinated by the WMO.

### WMO El Niño/La Niña Update

The WMO El Niño/La Niña Update is prepared on a quasi-regular basis (approximately every three months) through a collaborative effort between WMO and the International Research Institute for Climate and Society (IRI) as a contribution to the United Nations Inter-Agency Task Force on Natural Disaster Reduction. It is based on contributions from the leading centres around the world monitoring and predicting this phenomenon and expert consensus facilitated by WMO and IRI.

For more information on the Update and related aspects, please visit:

<https://public.wmo.int/en/our-mandate/climate/el-niñola-niña-update>